



Practitioner's Docket No. 3293.004A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ruggero M. Santilli )

Application No.: 09/826,183 )

Group No.: 1714

Filed: 04/04/2001 )

Examiner: C. D. Toomer

For: NEW CHEMICAL SPECIES OF CLUSTERS )

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Professor A.O.E. Animalu, declare and state:

1. I am a scientific professional who has reviewed the works of Dr. Santilli as it related to the principles embodied in the new chemical species of clusters.
2. My curriculum vitae is attached herein.
3. I have read the Official Action mailed February 13, 2006, and the reasons for rejection noted by the Examiner. I note that the Examiner alleges essentially that the chemical species invented by Dr. Santilli is not accepted by the scientific community, as contrary to chemistry as is known to date. In order to provide evidence of acceptability by the scientific community, I provide the following comments concerning my independent observation of the invention claimed by Dr. Santilli and/or my understanding of the new species of clusters.
4. Having worked with Dr. Santilli on the applications of isomechanics to Cooper pairing of electrons in superconductors (see, A.O.E. Animalu and R.M. Santilli, Int. J. Quantum Chemistry 29, 175 (1995)) (called hadronic superconductivity), I am satisfied that the extension of isomechanics to new chemical species (hadronic chemistry) is scientifically sound. Indeed, as a condensed matter physicist, my appreciation of Santilli's isomechanics of new species of clusters is that it is similar to the highly successful pseudopotential method in metal and semiconductor physics.

Dated: July 12, 2006

Declarant -

## CURRICULUM VITAE

**FULL NAME:** Professor Alexander Obiefoka Erukora ANIMALU, B.Sc. (Lond.); M.A. (Cantab.); Ph.D. (Ibadan); FAS, FNIP, FSES, FCAI, KSC, NNOM, IOM

**DATE AND PLACE OF BIRTH:** 28/8/38. Oba, Idemili South L.G.A. Anambra State.

**NATIONALITY:** Nigerian

**ADDRESS:** Institute for Basic Research, 4A Limpopo Street, F.H.A. Maitama, Abuja (Phone: 09-413-3759)

**E-mails:** [nascience@aol.com](mailto:nascience@aol.com); [ibr32@aol.com](mailto:ibr32@aol.com); **Website:** <http://www.i-b-r.org>

**MARITAL STATUS:** Married with Three Children.

### SECONDARY SCHOOL AND UNIVERSITY EDUCATION:

1952 - 1958: Dennis Memorial Grammar School, Onitsha: Graduated in 1956 with West African School Certificate (Grade one); and in 1958 with Cambridge Higher School Certificate in Science Subjects (General Paper, Physics, Chemistry, Mathematics and Further Mathematics), and also in 1958, London General Certificate of Education Advanced Level in Arts Subject (History, Latin, Pure Mathematics and Applied Mathematics).

1959/60-1961/62: University College, Ibadan (now University of Ibadan), on Shell-BP scholarship, graduated B.Sc. (Math.), Second Class Upper Division, June 1962; Winner Faculty of Science Prize for best performance for two consecutive years; Winner Crowe's Prize on Abstract Algebra and Theory of Numbers.

1962/63 - 1965 (Dec.); University of Cambridge, England, on University of Ibadan Postgraduate Scholarship. M.A. (Cantab.), Ph.D. (Ibadan). Supervisor of Ph.D. at Cavendish Laboratory, Cambridge, was Professor Volker Heine, FRS. Work led to invitation as Research Associate at Stanford University, California, Division of Applied Physics, under Professor Walter A. Harrison, who later published the Model Potential Tables from my Ph.D. Thesis in his book entitled: *Pseudopotentials in the Theory of Metals* (Benjamin, 1966); and this Ph.D. thesis work became a Citation Classic by 1983.

### SPECIALISATION AREA IN THEORETICAL PHYSICS:

a) Solid State Theory - Pseudo and Model Potential Methods in Electronic Energy Band Calculations, Lattice Dynamics, and Transport phenomena in metals and semiconductors; and superconductivity. b) Elementary Particle Physics - Quark Structure of Elementary Particles; Lie-isotopic and Lie-admissible generalizations of quantum mechanics. c) Grew up with computational physics from paper tapes, through punched cards, ..., personal computers and supercomputer workstation.

### POSITIONS HELD:

Director & CEO, Institute for Basic Research (2001- present), Director & CEO, National Mathematical Centre, Abuja (1999-2001); Professor of Physics, (since 1976) University of Nigeria, Nsukka (U.N.N.); (1992 - 95) Head, Department of Physics and Astronomy; 1994: Chairman, Committee on Organisation of the (Re-established) Federal Ministry of Science and Technology; 1991: Visiting Scientist, Department of Physics, University of California, Irvine, under Professor A.A. Maradudin; 1989/1990: First Chairman of the Governing Board for the Centre for Energy Research and Development, U.N.N.; the Board was responsible for planning the programs, budgets, staff and general administrative control of the Centre.

1987/88 - 1988/89: Dean, Faculty of Physical Sciences, U.N.N.: Position involved general administration of six departments in the Faculty - Computer Science, Geology, Mathematics, Physics & Astronomy, Pure & Industrial Chemistry, and Statistics; appointments and promotions, assessment of academic staff, membership of Vice- Chancellor's Committee of Deans, public relations, etc.

1987: Secretary, Ad-Hoc Committee on National Centre for Mathematical Sciences. The Committee's proposal to the Federal Government led to the establishment of the National Mathematical Centre at Abuja.

1981: Head, Department of Physics & Astronomy, U.N.N.

(1976 - 1981): Coordinator, National Solar Energy Research and Originator of proposal for the establishment of a Centre Energy Research and Development at U.N.N. submitted to the President of the Federal Republic of Nigeria (1981); Defended proposal successfully before the National Assembly (Senate) Committee for Science and Technology leading to funding under National Energy Research Projects at U.N.N., Obafemi Awolowo University, Ahmadu Bello University and Usman Dan Fodio University, Sokoto by the Executive Office of the President. (1980 - 81): Member of Federal Ministry of Science and Technology Ad-Hoc Committee on Energy; Work of committee prompted the Energy Commission of Nigeria Decree No. 62 Amendment Act. The Energy Commission was subsequently created in late 1980's. (1977 - 1981); Chairman, U.N.N. Board of Computer Centre.

#### **PREVIOUS POSITIONS IN U.S.A.:**

(1972 - 1976): Physicist, Lincoln Laboratory, Massachusetts Institute of Technology (M.I.T.), Lexington, MA 02173. Worked in the Solid State Division under Dr. H.J. Zeiger and Dr. J.B. Goodenough on research projects supported by the U.S. Air Force Contracts. Work was primarily on the development of the Transition-Metal Model Potential and completion of my textbook entitled: Intermediate Quantum Theory of Crystalline Solids, (Indian edition 1978, Russian Translation 1981); and supervision of M.I.T. Ph.D. students.(1970 - 1972): Associate Professor of Physics, Drexel University, Philadelphia. Position involved undergraduate recitation classes, teaching of graduate courses, research and supervision of Ph.D. students (1968 Sept. - 1970 Jan.) Assistant Professor of Physics, University of Missouri, Rolla. Member of Research team supported by the U.S. Air Force under Contract No. AFORFR-F-44620-69-C-0122 THEMIS: my contribution was on surface states in magnetic field (published in Phil. Mag. 21, 127 (1970). All other research works were supported by grant NSF GU-2587 to Physics Department, Univ. of Missouri, Rolla (under Assistant Professor Improvement Funds). (Jan. 1968 - August 1968): Research Associate, University of North Carolina at Chapel Hill, N.C.

(Jan. 1966 - Dec. 1967): Research Associate at Division of Applied Physics of W.W. Hansen Laboratories of Physics, Stanford University, California. Supervision of Ph.D. students and full time under Professor Walter A. Harrison; work was supported by Advanced Research Projects Agency through the Centre for Materials Research at Stanford University.

**OTHER POSITIONS:** Member, Honorary Presidential Advisory Council on Science and Technology in Nigeria (2001-); Member, Presidential Committee on Abuja Technology Park, (2001-present); Consulting Editor, Science and Technology News Published by the Federal

Ministry of Science and Technology (2002); Member, Advisory Editorial Board for Physica (Europhysics Journal, Netherlands 1979-); Editor, Hadronic Journal and Hadronic Journal of Physics (U.K.). Founding editor, Nigerian Journal of Solar Energy; Editor of Nigerian Journal of Physics (formerly Bull. Nigerian Institute of Physics) for many years.

**INTERNATIONAL BIOGRAPHICAL LISTING AND HONOURS:** American Men of Science, U.S.A. (11<sup>th</sup> Edition, Supplement 6, 1970); Community Leaders of America; Men of Achievement 1975 of International Biographical Centre (IBC), Cambridge, U.K.; Who's Who in the East, U.S.A.; Newswatch Who's Who in Nigeria (1990); The new WHO'S WHO in Nigeria by Nigerian International Biographical Institute 1999; Man of the Year 2000, American Biographical Institute; recipient of International Order of Merit (IOM) of IBC, Cambridge 2001.

**PROFESSIONAL ASSOCIATIONS:** President of the Nigerian Academy of Science (since January, 2001). Member American Physical Society (1966 - 1976); New York Academy of Science (1970 - 1976); Nigerian Institute of Physics (1976 - present) - Elected Fellow (FNIP) in 1994; Solar Energy Society of Nigeria (1979 - present) - Elected Fellow (FSES) in 1989; Nigerian Academy of Science - elected fellow in 1980. Chairman National Committee of the Deans of Science of Nigerian Universities, 1988 - 89. Founder/Staff Adviser Society for Promotion of Indigenous Inventions and Creativity (SPIIC) - A student society at the University of Nigeria; Founder/Staff Adviser: Century-21 Club - A student society at University of Nigeria. Awarded Fellow of Institute of Corporate Administration (FCAI) Nigeria in April 2001.

**HOBBIES:** Carpentry, Video-making, writing, music, etc. Video Productions 1) 1994: Technology Incubators in Nigeria; 2) 1995: Third World Academy of Science 5<sup>th</sup> General Conference at Abuja, Nigeria; 3) 1996: Zik of Africa - An Epitaph.

**CONFERENCES:** Have attended numerous learned society conferences and presented papers from 1964 to present. Highlights include:

1964: Low Temperature Physics Conference, LT9, at Cleveland Ohio, U.S.A.

1967: International Conference on the Properties of Liquid Metals (Advance. Phys. 16, 605, 1967).

1967 "March" Meeting of American Institute of Physics and subsequent years till 1975. 1975 Energy Development Opportunity for Small R & D Companies (U.S. E.R.D.A. - sponsored Conference, in which I was invited to give the luncheon address at Washington, D.C.).

1977 Conference on Electronic Structure and Properties of the Transition Metals in Canada (Inst. Phys. Conf. Ser. No. 39, 706 (1978). 1977 Organize National Solar Energy Forum (NASEF) in Nigeria as foundation president of the Solar Energy Society of Nigeria and published proceedings in Vols. 1 and 2 of the Nigerian J. of Solar Energy as foundation Editor-in-Chief of the Journal. 1979: Invited to Nigeria/U.S. Workshop on Technological Development in Nigeria held at City College, New York, U.S.A. 1983: Invited to ECOWAS (Economic Community of West African States) Energy Trieste, Italy.

1986: Attended Third International Conference on Hadronic Mechanics and Nonpotential Interactions at Patras, Greece.

1988: Interdisciplinary Conference on "African Systems of Thought" organized by the National Institute for Policy and Strategic Studies, Kuru, Jos.

1988: 4<sup>th</sup> International Conference on Hadronic Mechanics and Nonpotential Interactions, Yugoslavia.

1988: Conference of the National Committee of the Deans of Science of Nigerian Universities, Nsukka.

1989: West African Regional Conference on Group Theory in Physics, Univ. of Lagos, Nigeria.

1990: 5<sup>th</sup> International Conference on Hadronic Mechanics and Nonpotential Interactions, Cedar Falls, Iowa, U.S.A.

1990: Discussion Meeting of the Royal Society, on "Bonds and Structure of Solids" at London.

1994: Theoretical Physics Conference at the Sheda Science and Technology Complex (Shestco) Abuja.

1994: National Conference on Science, Technology and Socio-Economic Development, at Federal University of Technology, Yola.

1995: 5<sup>th</sup> General Conference of the Third World Academy of Sciences, at Abuja, Nigeria.

1996: Ran with Prof. V. Katiyr a National Workshop on Mathematical and Physical Modelling in Biology and Medicine at the National Mathematical Centre, Abuja (March, 1996).

1966: 3<sup>rd</sup> Africa-USA International Conference on Manufacturing Technology, August 12 - 15, Accra, Ghana.

1997: Presented Keynote Address entitled, Incidence of Examination Malpractice at Different Fiers of Education: Causes, Scope and General Effect on the Society, at the National Workshop/Seminar on Examination Ethics (June 2 - 3, 1997) at University of Nigeria, Nsukka.

1997: Corresponding Participant at the International Conference on Differential Geometry, Groups and Lie Algebras, held at Aristotle University of Tehssaloniki, School of Technology, Mathematics Division, Thessalonki, Greece, June 1997.

1999: Participated at the 4<sup>th</sup> Coordinating Council Meeting of the Commission on Science and Technology for Sustainable Development in the South (COMSATS) at Beijing, 9-10 December, 1999.

2000: National Mathematical Sciences Summit at Abuja (July, 2000)

2001: Inter-Academy Panel Workshop on Capacity Building for Academies of Science in Africa.

## **PUBLICATIONS:**

1. Nonlocal Dielectric Screening in Metals, Phil. Mag. 11, 379 (1965).
2. The Screened Model Potential for 25 Elements, Phil. Mag. 12 1249 (1965); (with V. Heine). This paper is now a CITATION CLASSIC having been cited 729 times to date (see, Contemporary Classics in Physical, Chemical and Earth Sciences; June 1986 and Current Contents published by the Institute for Scientific Information, January 31, 1983, ISI PRESS, 3501 Market Street, Philadelphia PA 19104, U.S.A. or <http://www.isinet.com>
3. The Spin-Orbit Interaction in Metals and Semiconductors, Phil. Mag 13, 53 (1966).
4. The Electron-Phonon Contribution to the Specific Heat of Alkali Metals, Nuov. Cim. 42B, 83 (1966) (with F. Bonsignori and V. Bortolani).
5. The Phonon Spectra of Alkali Metals and Aluminium, Nuov. Cim 44B, 159 (1966) (with F. Bonsignori and V. Bortolani).
6. The Total Bandstructure Energy for 29 Elements, Proc. Roy. Soc. (London) 294A, 376 (1966).
7. The Pressure Dependence of the Electrical Resistivity, Thermopower and Phonon Dispersion in Liquid Mercury, Adv. Phys. 16, 605 (1967).

8. The Electronic Structure of Ca, Sr and Ba Under Pressure, Phys. Rev. 154, 535 (1967) (with V. Heine and B. Vasvari).
9. Electronic Theory of Phase Transition in Ca, Sr, and Ba Under Pressure, Phys. Rev. 161, 445 (1967).
10. Optical Conductivity of Simple Metals, Phys. Rev. 163, 557 (1967).
11. Self-Consistent Theory of Optical Conductivity of Simple Metals, Phys. Rev. 163, 562 (1967).
12. Many-Electron Effects in Optical Conductivity of Simple Metals by Kubo Formula, Phys. Rev. B2, 282 (1970).
13. General Theory of Magnetic-Field-Induced Surface States, Phil. Mag. 21, 137 (1970).
14. Mass Ratio of Quarks Phys. Rev. D3, 1106 (1971).
15. Charge Spectrum of Four-Component Fields with O(4,2) Symmetry, Phys. Rev. D4, 1922 (1971).
16. Bond States and Mass Spectra of Hadrons in the Quark Model, Nuov. Cim. Letters 2, 677 (1971).
17. High-Field Magnetoresistance of Metals by Kubo-Mott Formula, Annals Phys. 70, 150 (1972).
18. Pseudopotential Approach to Magnetic Energy Bandstructure and Magnetic Breakdown in Metals, Annals Phys. 70, 171 (1972).
19. Scale Symmetry, Phys. Today p. 76, June 1972.
20. Lepton and Hadron Currents in O(4,2) Current Algebra, Nuov. Cim. Letters 3, 729 (1972)
21. Relativistic Model of Quark-Quark Strong Interactions, Nuov. Cim. Letters, 6, 504 (1973).
22. Electronic Structure of Transition Metals, I. Quantum Defects and Model Potential, Phys. Rev. B8, 3542 (1973).
23. Electronic Structure of Transition Metals, I. Quantum Defects and Model Potential, Phys. Rev. B8, 3542 (1973).
24. Electronic Structure of Transition Metals. II. Phonon Spectra, Phys. Rev. B8, 3555 (1973).
25. Josephson Current in Tunneling Between Coupled Superconductors, Phys. Rev. B8, 4420 (1973).
26. Electronic Structure of Transition Metals III. D-Band Resonance and Regge-Pole Theory, Phys. Rev. B10, 4964 (1974).
27. Energy Development Opportunities in the Third World for Small R & D Companies (1975).
28. Lattice Dynamics of Transition Metals in the Resonance Model, Phys. Rev. B13, 2398 (1976) (with B. Oli).
29. Microscopic Theory of the Lattice Dynamics of Hcp Rare-Earth Metals, Phys. Rev. B15, 1867 (1977) (with J.C. Upadhyaya).
30. Priorities for Science and Technology Education in Nigeria (Physics Workshop for Secondary School Teachers, 1977 ed. A.O.E. Animalu).
31. A Model for Energy Research and Development Administration in Nigeria (proc. Energy Policy Conf. Jos, August 2-4, 1978 p.9, ed. E.N.C. Osakwe).
32. Microscopic Theory of the Lattice Dynamics of Vanadium and Niobium, Inst. Phys. Conf. Ser. No. 39, 706 (1978).
33. Generalized APW Formulation of the Transition Metal Model Potential, Inst. Phys. Conf. Ser. No. 39, 28, (1978) (with A/P/ Maclin).
34. Models for Technology Transfer Between Nigeria and the U.S.A. (Nigeria-U.S.A. Workshop on Technology Development in Nigeria, April, 1979, ed. M. Amoda and C.D. Tyson) P. 240.

35. Measurement of Solar Insolation at Nsukka, Nig. J. Solar Energy, 1, 45 (1980) (with I.R.N. Awachie and J.C. Obodo).
36. Stability of Titanium Oxide (TiO<sub>2</sub>) Electrode in Photolysis of Water, Bull. Nig. Ins. Phys. 4, 85 (1980) with I.S.O. Muodebe).
37. Solar Energy Society of Nigeria - A vehicle for Transfer of Industrial Experience, Nig. J. Solar Energy 1, 1 (1980).
38. Strategy for Biomedical Technology in Development Countries: Proceedings of the Symposium on Strategy for Medical Research in Nigeria organised by the National Institute for Medical Research, Yaba, Nigeria, May 19 - 22, 1980.
39. Loss Functions and Electronic Structure of Titanium and Vanadium Oxides, Physica 674B, 1, 1981 (with I.S.O. Muokebe).
40. Screening of the Short-Range Potential by the Local Field Correction in the Lattice Dynamics of Vanadium (J. de Physique, C6-410 (1981) (with B.N. Onwuagba).
41. Quark Approach to Santilli's Conjecture on Hadronic Structure, Hadronic J.5, 1964 (1982).
42. Possible Identification of Quarks with Leptons in Lie-Isotopic SU(3) Theory, Hadronic J.7, 19664 (1982).
43. Energy Research in Nigeria: A Scientist's Viewpoint, Nig. J. Solar Energy, 2 xiii, (1982).
44. Solar Energy Training, Research and Development in Nigeria, Discourses of the Nig. Acad. Of Science 5, 1 (1983).
45. Can the Pseudopotential Method be Used in High-Energy Physics? Bull. Nig. Inst. Phys. 5, 1 (1984).
46. Design, Construction and Characterization of High Temperature Furnaces in Nigeria and their Application to Crystal Growing, Bull. Nig. Inst. Phys. 5, 48 (1984) (with C.E. Okeke, A.C. Agbaka and A.J. Varkey).
47. Energy and Materials Research and Development for Telecommunications in Nigeria (Proc. Of Seminar on Alternative Sources of Energy for Telecommunications, NITEL, 16 - 17 Sept., 1985).
48. Relativistic Hadronic Mechanics of Extended Deformable Particles, Hadronic J.9, 61 (1986).
49. Lie-Admissible approach to "Extended Relativity". I. Nonlinear Velocity, Mass and Charge Transformations, Hadronic J. 10, 321 (1988).
50. Fast Ion Transport in Solid Electrolytes, Proc. Nig. Acad. Of Science, 1, 25 (1986) (with I.S.O. Muokebe).
51. Science, Religion and African Culture, Discourses of Nig. Acad. Science, 9, 45 (1988).
52. Logic, Priorities and Options of the (National Science and Technology) Policy: (Implementation of the National Science and Technology Policy - Recommendations and Conference Proceedings of the National Committee of the Deans of Science of Nigerian Universities, 1988 ed. Alexander O.E. Animalu).
53. Coexistence of Phonon and magnon Exchange Mechanisms for Electron Pairing in Superconducting CdBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>, Phonons '89 Abstracts, Heidelberg, W. Germany (with C.M.I. Okoye); and to appear in The African J. of Science and Technology.
54. Effect of Coal and Charcoal on Solar-Still Performance, Energy 15, 1071 (1990) (with C.E. Okeke and S.U. Egarievwe).
55. Short, Medium and Long-Term Energy Transition Strategy for Africa (UNDP PROJECT RAF/87/068 Lome Seminar on Impending Energy Transition: Prospects and Role of New and Renewable Energy Systems in Africa, organised by The African Regional Centre for Technology at Dakar, Senegal, 1990).

56. Quantization Rule for Hadronic Mechanics (Hadronic Mechanics and Nonpotential Interactions, Nova Science, N.Y. 1990 (with R.M. Santilli).
57. Lie-Isotopic SU(3) Theory of the Compressed Hydrogen Atom, 5<sup>th</sup> Int. Conference on Hadronic Mechanics and Nonpotential Interactions, Nova Science, N.Y. 1991.
58. Birkhoffian Mechanics of Velocity - Dependent Force in the "Extended Relativity" of Deformable Bodies, 5<sup>th</sup> Int. Conference on Hadronic Mechanics and Nonpotential Interactions, Nova Science, N.Y. 1991 (with N.C. Animalu).
59. Harmattan Performance of a Solar Still in the Guinea Savannah. Renewable Energy 1, 799 (1991) (with S.U. Egarievwe and C.E. Okeke).
60. Applications of Hadronic Mechanics to the Theory of Pairing in High-Tc Superconductors, Hadronic J. 14,459 (1991).
61. Professor Chike Obi: A Profile, J. Nig. Math. Soc. 11, i. (1992).
62. Semiotic Theory of the Origin and the Judeo-Christian Tradition of the Igbo People, Presented at Special Memorial Seminar on F.C. Ogbalu and the Crusade for Igbo Language, 27 - 29 May, 1992.
63. Isominkowskian Theory of Cooper Pairs in Superconductors, Hadronic J. 16, 411 (1993).
64. Nonlocal-Isotopic Representation of Electron Pairing in Superconductivity, VI Trilateral German-Russian-Ukrainian Seminar on High-Tc Superconductivity, Sept. 14 - 18, 1993, Dubna (with R.M. Santilli) eds. V.L. Aksenov and E.I. Komilov.
65. Isosupercuductivity: A Nonlocal Nonhamiltonian Theory of Pairing in High-Tc Superconductors, Hadronic J. 17, 349 (1994).
66. Nonlocal Theory of Cooper Pairing in High-Tc Superconductors (Paper presented at Shestco Conference, Abuja, Nigeria 1994 (with C.M.I. Okoye and G.C. Asomba).
67. Comparison of the BCS and Hubbard Hamiltonian Models for a Superconductor in the Wannier Representation (Paper presented at Shestco Conference, Abuja, Nigeria, 1994 (with F.I. Okeke and C.N. Animalu).
68. Nigerian Men of Mathematics: Glimpses and Reminiscences - Keynote address at the Nigerian Mathematical Society's Programme of Honour and Launching of Special Issues of the Journal of the Nigerian Mathematical Society in honour of Prof. Chike Obi, Prof. Adegoke Olubummo and Prof. James O.C. Ezeilo, at University of Lagos, July 23, 1994.
69. On Making the Igbo Language Scientific, Proceedings of the Symposium on Archdeacon T.J. Dennis, the D.M.G.S. and the Niger Diocese (Anglican Communion) (September, 1994. Ed. A.O.E. Animalu and C.J. Ogbuka).
70. Nonlocal Isotopic Representation of the Cooper Pair in Superconductivity, Int. J. Quantum Chemistry, 1995 (with R.M. Santilli).
71. Isosuperconductivity: The Journey So Far, Paper presented at Inauguration Conference of Istituto per la Ricerca di Base (I.R.B.) at Monteroduni, Molise, Italy August 7 - 14, 1995 p. 177 of New Frontiers in Hadronic Mechanics, edited by T.L. Gill (Hadronic Press 1996).
72. Extension and Re-Interpretation of the BCS Model for High-Tc Cuprate Superconductors, Paper presented at the Inauguration Conference of I.R.B., 1995 appear in Hadronic J. 1997) (with G.C. Asomba).
73. Analogous Hadronic Structure of Mesons and Cooper Pairs, Paper presented at the Inauguration Conference of I.R.B., 1995 (with N.C. Animalu) p. 169 of New Frontiers in Hadronic Mechanics, edited by T.L. Gill (Hadronic Press 1996).
74. Technology-Business Incubators I Nigeria, Presented at 3<sup>rd</sup> Africa-USA International Conference on Manufacturing Technology at Accra, Ghana, August 12 - 15, 1996.



75. Lie-Santilli Iso-Approach to the Unification of Electronmagnetism and Gravitation, Hadronic J. 19, p. 255 (1996).
76. Visual Image of Cooper Pairing in High-Tc Superconductors (with T.L. Gill), (appeared in Hadronic J. 1997).
77. Reformulation of the Tight-Binding Theory of Band Offset at Semiconductor Heterojunction" (with A.J. Ekpunobi & C.E. Okeke) Physica B 271, 364-368 (1999)
78. Some Third-Order Differential Equations in Physics pp.28-40 (Contributions to the Development of Mathematics in Nigeria, edited by A.O.E. Animalu, S.O. Iyehen and H.O. Tejumola, published by National Mathematical Centre, Abuja, ISBN 978-8010-73-3, 2000).
79. Applications of Projective Geometry to Particle Physics pp.285-302 (Contributions to the Development of Mathematics in Nigeria, edited by A.O.E. Animalu, S.O. Iyehen and H.O. Tejumola, published by National Mathematical Centre, Abuja, ISBN 978-8010-73-3, 2000).
80. New Theory on the Structure of the Rutherford Santilli Neutron (Hadronic J. 26, 637 2003)

#### BOOKS:

1. *Intermediate Quantum Theory of Crystalline Solids*, Prentice-Hall, New Jersey, U.S.A. 516 pages, 1977. Indian Edition, Prentice-Hall of India Private Limited, 1978; Russian Translation, 1981. Reprinted in U.S.A. 1994.
2. *Four Chapters on Solar Energy, Nuclear Energy, Alternate Energy Sources, Electric Power demand, generation and distribution - the Nigerian Scene* in the Book: Man and his Environment, Longman, Nigeria Ltd, 1982, ed. O.C. Nwankiti.
3. *Physical Sciences, Scope and Career Opportunities* (ADOA Press, 1988, with P.N. Okeke, C.A. Nwadinigwe, K.M. Onuoha. K.O. Uma, L. Onyekwelu, A.O. Amadi, C.C. Agunwamba and E.C. Oni).
4. *From African Symbols to Physics* (1988 Desk Published, with W.A. Umezina).
5. *Ucheakonam: A Way of Life in the Modern Scientific Age* (1990 Ahiajoku Lecture presented at the Grasshopper International Stadium in Owerri, Imo State, under the auspices of Imo State Government; A medallion was presented to the Ahiajoku Lecturer in this cultural festival lecture attended by over 20,000 persons.
6. *Proceedings of the Symposium on Archdeacon T.J. Dennis, the D.M.G.S. and the Niger Diocese* (Anglican Communion) ed. A.O.E. Animalu and C.J. Ogbuka (Ucheakonam Foundation, Nsukka, ISBN 978-2919-10-1, 1995).
7. *Life and Thoughts of Professor K.O. Dike* (Ucheakonam Foundation, Nsukka, ISBN 978-34207-1-2, 1997).
8. *Zik of Africa: An Epitaph* (Ucheakonam Foundation, ISBN 978-2919-35-7 1996).
9. *Biography of Sir Dr. E. Chukuka Ezekwesili* (Ucheakonam Foundation, Nsukka, ISBN 978-34207-0-4, 1997).
10. *Professor Chike Obi: A biography of the Foremost African Mathematical genius of the 20<sup>th</sup> Century* (Published by National Mathematical Centre, Abuja, 2001) ISBN 978-049-049-3.
11. *Electricity and Magnetism for University Students* (Ucheakonam Foundation, Nsukka, ISBN 978-34207-2-0, 1998).
12. *Education, Science and Technology Agenda for Nigeria in the 21<sup>st</sup> Century*, (Nigerian Academy of Science, ISBN-978-2162-16-7, 2000)

13. *Contributions to the Development of Mathematics in Nigeria* (co-editors: S.O. Iyahan, H.O. Tejumola) (National Mathematical Centre, ISBN 978-8010-73-3, 2000).
14. *Hot Issues in Contemporary Nigerian Science and Technology Policy* (Ucheakonam Foundation (Nig.) Ltd 2003) ISBN: 978-34297-7-1
15. *Igbo Day Lectures 2001* (Ucheakonam Foundation, 2001) ISBN:978-34207-4-7 .
16. Professor Chike Obi, A Biography of the foremost Africa Mathematical Genius of the 20<sup>th</sup> Century (NMC, 2001, ISBN 978-049-049-3).
17. *Science Today in Nigeria. 2002* (co-edited with Prof. S.A. Adekola) published by Nigerian Academy of Science (ISBN:978-2162-17-5)
18. *Science Today in Africa . 2002* (editor), Nigerian Academy of Science (ISBN: 978-21-62-18-3).
19. *The Southeast: The Way Forward* (co-edited with Prof. P.O. Ngoddy and Prof. P.A. Nwachukwu) (Ucheakonam Foundation (Nig.) Ltd, 2003) ISBN: 978-34207-7-1.
20. *Igbo Day Lectures 2004* (Ucheakonam Foundation Nig. Ltd, 2004) ISBN: 978-34207-8-X
21. *The World Summit on Sustainable Development at Johannesburg.2002: Emerging Issues in Nigeria* (co-edited with A. Abdullahi and V.O.E. Adeoba), (Published by Ucheakonam Foundation (Nig.) Ltd, 2005) ISBN: 978-34207-8-X.